



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350

IN REPLY REFER TO
OPNAVINST 4790.13
OP-325
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OPNAV INSTRUCTION 4790.13

From: Chief of Naval Operations

Subj: MAINTENANCE OF SURFACE SHIP ELECTRONIC EQUIPMENT

Ref: (a) OPNAVINST 4700.7G (NOTAL)
(b) OPNAVINST 5000.49A (NOTAL)
(c) MIL-STD 2165
(d) OPNAVINST 4700.19E (NOTAL)

Encl: (1) Definitions
(2) List of Acronyms

1. Purpose. To establish the maintenance policy for surface ship electronic equipment.
2. Scope. This instruction applies to all surface ships of the United States Navy with electronic equipment and the System Commands (SYSCOMS) that acquire and support equipment. This includes electronic equipment in combat systems as well as electronic components in hull, mechanical, and electrical systems. This instruction does not apply to nuclear propulsion, fleet ballistic missile/strategic weapon, and avionic systems.
3. Definitions. Applicable definitions are in enclosure (1).
4. Policy. It is the policy of the Chief of Naval Operations (CNO), as stated in references (a) and (b), that maintenance will be accomplished at the lowest practical level which ensures an optimum economic use of resources and achieves required operational readiness. There are three levels of maintenance for electronic equipment: organizational, intermediate, and depot.
 - a. The SYSCOMS have the responsibility to plan and provide for Integrated Logistic Support (ILS) for the electronic equipment developed (reference (b)) and to formulate a Maintenance Plan supported by a Logistic Support Analysis (LSA) and a Level of Repair Analysis (LORA). The assignment of tasks to a maintenance level is based on operational requirements, mission essentiality, and the LORA.
 - b. The Surface Miniature/Microminiature (2M) Program has significantly improved organic capability to repair electronic printed circuit boards. The Support and Test Equipment Engineering Program

(STEEP) provides the necessary automatic test equipment to screen and diagnose printed circuit boards. Program managers must take into account the 2M capability at the organizational and intermediate level when developing maintenance plans.

c. A progressive repair concept shall be implemented for depot repairables where practical. Under this concept, depot repairables go to the intermediate level (I-level) first for screening and repair, if possible. When an item is beyond I-level capability, it goes to the depot for repair. Both the design and maintenance plan should support progressive repair. Progressive repair encourages rapid turnaround of unserviceable items at the lowest practical level. If the program manager does not employ Progressive Depot Level Repair (PDLR), he or she must justify this during the ILS certification process.

d. The Source, Maintenance, and Recoverability (SM&R) code identifies the maintenance levels that may remove, repair, replace, or condemn an item. The SYSCOMS determine the SM&R code when developing the maintenance plan. The selected SM&R code shall assign repairs to the lowest practical level.

e. The program manager shall provide ILS support to the maintenance activities identified in the maintenance plan. This includes spare parts, training, facilities, support and test equipment, and documentation.

f. The SYSCOMS must design testability and diagnostic effectiveness into systems and equipment. Reference (c) shall be incorporated in the design at the system, subsystem, equipment, assembly, and module level. Through LORA and trade-off analyses, the acquisition manager should develop a testing concept that defines the use of built-in test (BIT), off-line General Purpose Electronic Test Equipment (GPETE), and automatic test equipment. The test concept should take into account the Navy's inventory of test equipment.

g. For existing systems with inadequate maintenance plans, CNO may direct the SYSCOMS to establish broader maintenance capability. This determination will be based on operational requirements, fleet recommendations, and available resources.

5. Responsibilities

a. Chief of Naval Operations

(1) The OPNAV Logistic Review Group (LRG) shall review ACAT I and II systems to ensure the ILS plans consider three levels of maintenance and progressive depot level repair.

b. Commander, Naval Sea Systems Command

(1) Incorporate the policies of this instruction for newly developed or redesigned electronic systems/equipment during acquisition.

(2) Incorporate the policies of this instruction for existing electronic systems when the present maintenance concept and logistic support do not meet the established requirements for operational readiness and the equipment meets the mission essentiality requirements in reference (d).

(3) Serve as the technical agent for the Surface Miniature/Microminiature (2M) Program and the Support and Test Equipment Engineering Program (STEPP).

(4) Review the implementation of these policies during ILS certification process for ACAT III and IV programs.

c. Commander, Space and Naval Warfare Systems Command

(1) Incorporate the policies of this instruction for newly developed or redesigned electronic systems/equipment during acquisition.

(2) Incorporate the policies of this instruction for existing electronic systems when the present maintenance concept and logistic support do not meet the established requirements for operational readiness and the equipment meets the mission essentiality requirements in reference (d).

(3) Review the implementation of these policies during ILS certification process for ACAT III and IV programs.

d. Commander, Naval Air Systems Command

(1) Incorporate the policies of this instruction for newly developed or redesigned shipboard electronic systems/equipment during acquisition.

(2) Incorporate the policies of this instruction for existing shipboard electronic systems when the present maintenance concept and logistic support do not meet the established requirements for operational readiness and the equipment meets the mission essentiality requirements in reference (d).

(3) Review the implementation of these policies during ILS certification process for ACAT III and IV programs.

e. Commander, Naval Supply Systems Command

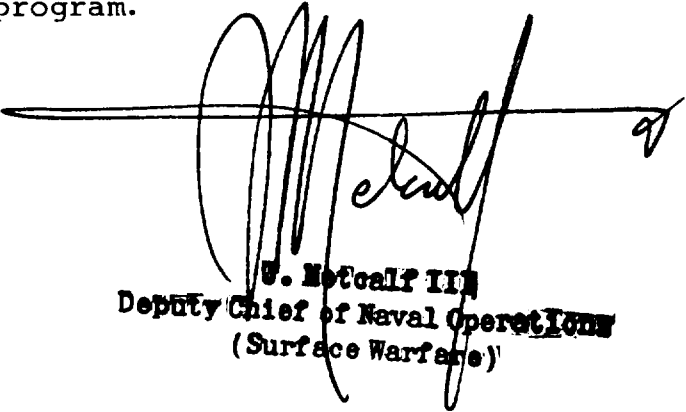
(1) Ensure that supply procedures are in consonance with policy.

(2) Ensure that supply support is provided under the maintenance requirements developed by the SYSCOMS under this instruction.

f. Fleet Commanders in Chief

(1) Review ACAT I, II, and III integrated logistic support plans before first fleet installation.

(2) The Fleet Commanders in Chief shall support the policies in this instruction by ensuring maintenance is accomplished in accordance with approved maintenance plans and by operationally administering the Surface 2M program.



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DEFINITIONS

Combat Systems. Generally, this includes devices and systems in the fields of detection and tracking, recognition and identification, communications, aids to navigation, weapons control and evaluation, electronic countermeasures, and test equipment. Combat Systems usually have electro-mechanical support systems that are essential for operation, such as power supplies, hoists, cooling and air systems.

Depot Maintenance. The third level of maintenance requires skills and facilities beyond the capability of the organizational and intermediate levels. The depot level is comprised of naval and private shipyards, the ship repair facilities, and designated overhaul points. Depot maintenance includes major rework, full restoration, manufacturing, large scale repairs, and modernization. Furthermore, depots support lower levels with engineers and technical assistance.

Intermediate Maintenance. The second level of maintenance provides support beyond the capability of the organizational level. The intermediate level is comprised of Navy personnel in tenders, repair ships, and shore intermediate maintenance activities (IMAs). Intermediate maintenance includes calibration, repair or replacement of damaged parts, emergency fabrication of unavailable parts, verification testing, and fault isolation. Furthermore, IMAs support the organization levels with technical assistance.

Maintenance. This is the action of keeping material in good repair. Maintenance includes inspection, service, repair, modification, modernization, and restoration.

Maintenance Plan. The plan that translates the three level maintenance concept into a set of tasks that will ensure that the equipment meets its requirements for availability. The acquisition managers use the maintenance plan to develop and procure the logistic support for the three maintenance levels.

Organizational Maintenance. The first level of maintenance is the user organization. It consists of the preventive and corrective maintenance performed by the ships crew. It consists of equipment operation, inspection, service, replacement of parts, and repairs.

Progressive Depot Level Repair (PDLR). This refers to the sequential movement of unserviceable depot level repairables (DLRs) from the ship to the depot. DLR with SM&R codes for removal at the organizational level should go first to the intermediate level for verification and repair. If the DLR is beyond the capability of the IMA, then it should go to the depot for repair.

Enclosure (1)

Support and Test Equipment Engineering Program (STEEP). The STEEP provides automatic test equipment for surface miniature/microminiature (2M) stations. At this time, the AN/USM-465 is the standard test set. It can screen digital PCBs and diagnose faults. More capable testers are under development for analog and hybrid boards.

Source, Maintenance, and Recoverability (SM&R) Code. The SM&R code identifies the lowest maintenance level that may repair, replace, or condemn an item. The HSC determines the SM&R code when developing the maintenance plan.

Surface Miniature/Microminiature (2M) Program. The Surface 2M Program provides repair capability for modern printed circuit boards and miniature electronic components. Most surface combatants, as well as mobile IMAs, have 2M repair stations. Ashore, there are 2M stations at IMAs, Ship Repair Facilities, and other maintenance facilities that directly support surface ships. OPNAV will review requests for participation in the 2M Program based on Fleet needs, repair assets, maintenance policy, and budget.

Testability. A design characteristic which allows the status (operable, inoperable, or degraded) of an item to be determined and the isolation of faults within the item to be performed in a timely manner.

Enclosure (1)

LIST OF ACRONYMS

ACAT	Acquisition Category
CNO	Chief of Naval Operations
DLR	Depot Level Repairable
FLTCINC	Fleet Commanders in Chief
ILS	Integrated Logistic Support
ILSP	Integrated Logistic Support Plan
IMA	Intermediate Maintenance Activity
LORA	Level of Repair Analysis
LRG	Logistic Review Group
LSA	Logistic Support Analysis
PDLR	Progressive Depot Level Repair
SM&R	Source, Maintainability, and Recoverability
STEPP	Support and Test Equipment Engineering Program
SYSCOM	System Command
2M	Miniature/Microminiature
3M	Maintenance and Material Management

Enclosure (2)